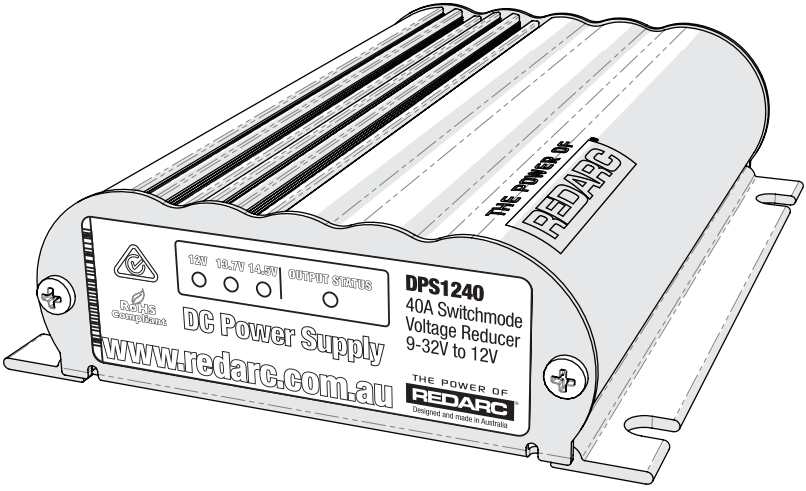
THE POWER OF

REDARC®

In-vehicle DC Power Supply

DPS1225, DPS1240, DPS2410 & DPS2420



AUSTRALIAN DESIGNED

AUSTRALIAN BUILT

TWO YEAR WARRANTY

THE DPS1225, DPS1240, DPS2410 & DPS2420

The DPS series In-vehicle DC Power Supplies feature technology designed to supply 12V or 24V (model dependant) electrical loads such as lamps, radios, small motors, computer and communications equipment, fridges, pumps and TVs from a 12V or 24V automotive power system.

WARNING & SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains IMPORTANT SAFETY INSTRUCTIONS for the DPS1225/DPS1240/DPS2410/DPS2420 DC Power Supplies.

DO NOT OPERATE THE POWER SUPPLY UNLESS YOU HAVE READ AND UNDERSTOOD THIS MANUAL AND THE POWER SUPPLY IS INSTALLED AS PER THESE INSTALLATION INSTRUCTIONS.

⚠ WARNING

DO NOT USE THE DPS1225/DPS1240/DPS2410/DPS2420 TO CHARGE BATTERIES. DOING SO MAY RESULT IN HARM TO THE USER AND/OR DAMAGE TO THE DPS1225/DPS1240/DPS2410/DPS2420.

⚠ CAUTION

1. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised or have been instructed on how to use the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
2. Do NOT alter or disassemble the Power Supply under any circumstances. All faulty units must be returned to REDARC for repair. Incorrect handling or reassembly may result in a risk of electric shock or fire and may void the unit warranty.
3. Check the manufacturers data for your equipment/loads and ensure the maximum voltage of the DPS1225/DPS1240/DPS2410/DPS2420 does not exceed the manufacturers recommended maximum operating voltage.
4. The DPS1225/DPS1240/DPS2410/DPS2420 will achieve best results when proper load and vehicle maintenance is regularly performed.

TABLE OF CONTENTS

	PAGE
Warnings and Safety Instructions	01
Contents	02
Specifications	03
Fusing	03
1. Product Function	04
1.1 Display Panel	04
1.2 Unit Performance Characteristics	05
1.3 Error Codes	06
2. Installation	06
2.1 Red Wire	06
2.2 Blue Wire	07
2.3 Orange Wire	07
2.4 Brown Wire	08
2.5 Black Wire	08
2.6 Green Wire	08
2.7 Earth Isolation	08
2.8 Cable Sizing	09
2.9 Wiring	09
2.10 Connecting in Parallel	11
3. Troubleshooting	12
4. Notes	13
5. Two Year Product Warranty	14

SPECIFICATIONS

Part Number	DPS1225	DPS1240	DPS2410	DPS2420
Input Voltage Range	9-32V			
Recommended Input Fuse[*1]	40A *REDARC FK40 recommended*	60A *REDARC FK60 recommended*	40A *REDARC FK40 recommended*	60A *REDARC FK60 recommended*
Nominal Output Current Rating	25A	40A	10A	20A
Surge Current Rating	50A	80A	20A	40A
Recommended Output Fuse[*1]	40A *REDARC FK40 recommended*	60A *REDARC FK60 recommended*	40A *REDARC FK40 recommended*	40A *REDARC FK40 recommended*
No Load Current	<100mA		<200mA	
Standby Current	<5mA			
Output Voltage (selected with Orange wire)				
No Connection	12.0v		24.0v	
Earth	13.7v		27.4v	
Positive supply	14.5v		29.0v	
Line & Load Regulation	±1%			
Conversion Efficency	>94%			
Operating Temperature	-50 to +50°C			
Weight	680g			
Dimensions (mm)	150 x 120 x 37			
Standards	CE, C-Tick, AS/NZS CISPR1 1:2004			
Warranty	2 Years			

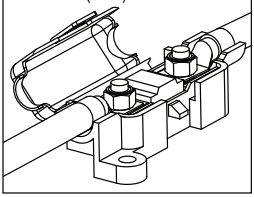
*1. Please refer to FUSING below.

FUSING

REDARC recommend using MIDI style bolt down fuses as they ensure a low resistance connection. The REDARC FK40 and FK60 fuse kits are recommended.

Blade type fuses are not recommended as they can result in a high resistance connection which causes excess heat and may damage the fuse holder and/or the wiring. Self-resetting circuit breakers are not recommended as they may trip prematurely and continue to cycle until failure, due to the heat generated by the current flowing through the wires.

A single fuse and holder setup from the Fuse Kits available from REDARC. Part number FK40 (40A) or FK60 (60A).



1 PRODUCT FUNCTION

The DPS1225/DPS1240/DPS2410/DPS2420 is a DC-DC power supply designed to run electrical loads. The input voltage of the DPS can be above, below or equal to the output voltage making it ideal for running equipment where specific load voltages or extreme voltage drop are an issue.

The DPS is also designed to isolate the main battery from the load when the vehicle is turned off to avoid flattening the vehicle's starter battery.

1.1 Display Panel

The front panel features 4 LEDs to display the voltage level and output status.

LED State	'Voltage Level' LEDs	'Output Status' LED
Off	Unit has no Power	Output is off
Blinking	Unit is in Standby	Unit is supplying power
On	Unit is on and can supply power	

When blinking, the flash duty-cycle of the 'Output Status' LED will increase to reflect the amount of current being supplied - If the LED is ON solid, the unit is supplying full power (e.g. 25A for a DPS1225).

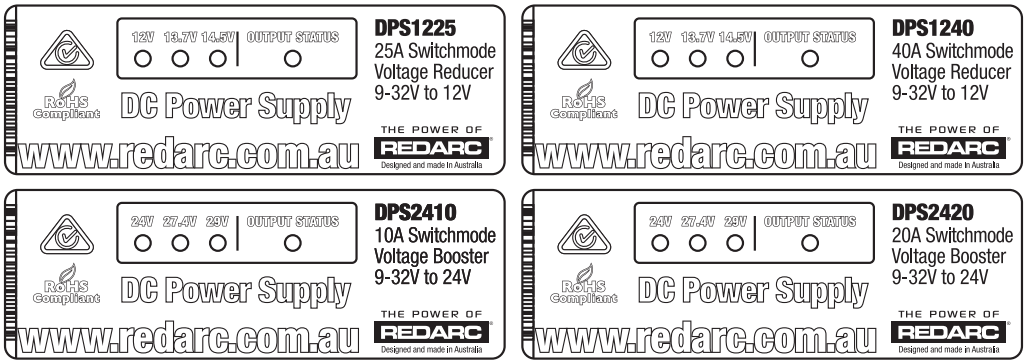
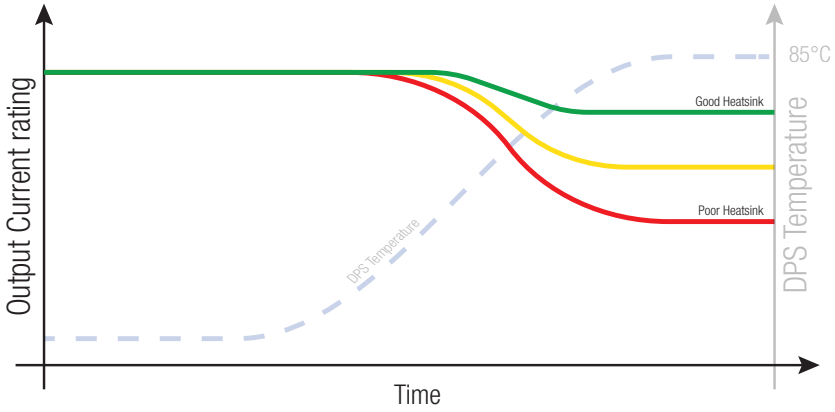


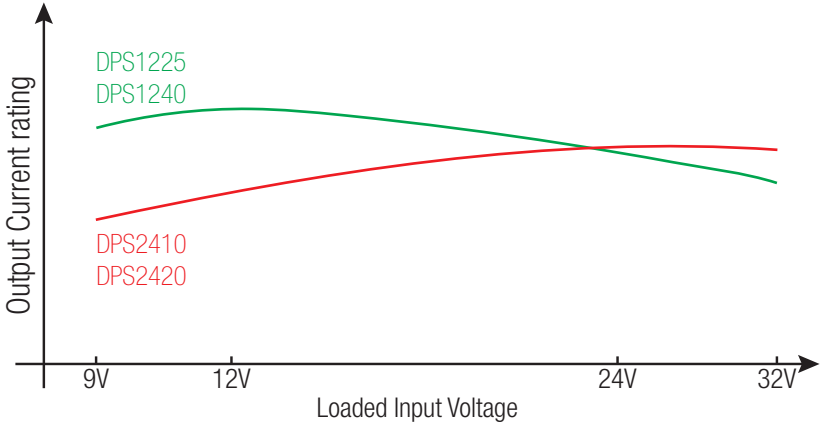
Figure 1.1.1 - The DPS Series Front Panels

1.2 Unit Performance Characteristics

The DPS Should be mounted to the vehicle's chassis to allow adequate heat-sinking. If the DPS experiences extreme ambient temperatures its output power may decrease until a steady-state is achieved. Better heat-sinking will enable greater power output.



The DPS is able to overcome substantial voltage drop by acting as a voltage booster. Voltage drop (as a result of inadequate input cable size) can cause excessive heat to be generated in the wiring. To ensure the wiring is protected the DPS will try to limit the difference between input and output voltage by reducing the current draw on the input of the unit. To ensure full power output is maintained suitable cable size (as outlined in section 2.8) should be used.



1.3 Error Codes

In the event of a fault with the unit, installation, input supply or output loads, both the External LED and ALL the LEDs on the unit will flash to indicate the fault type. Flashing sequences are described in the table below.

LED State	Description
1 flash (1 flash followed by 3.5 second off)	Internal Hardware Fault
2 flash (2 flash followed by 3.5 second off)	Not Used
3 flash (3 flash followed by 3.5 second off)	Unit over temp fault
4 flash (4 flash followed by 3.5 second off)	Output over voltage
5 flash (5 flash followed by 3.5 second off)	Not Used
6 flash (6 flash followed by 3.5 second off)	Input over voltage
7 flash (7 flash followed by 3.5 second off)	Reverse polarity

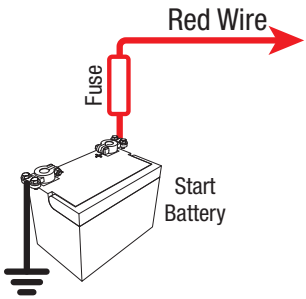
NOTE: The unit will operate optimally below 55°C with good airflow. At higher temperatures the unit will de-rate output current.
NOTE: Appropriate connections must be made to the wires with continuous current ratings as per the specifications table on page 3.

2 INSTALLATION

The DPS cannot be installed in direct heat environments such as the vehicles engine bay, the DPS performs at its best when the unit is mounted to the chassis for external heat sinking. The DPS1225/DPS1240/DPS2410/DPS2420 has 6 wires and should be installed as described over the following pages.

2.1 RED wire - Input Source Positive

The RED wire should be connected to the positive input from the vehicle's starter battery.
Appropriate size fuses should be used as per the specifications table on page 3.



2.2 BLUE wire - Ignition Control

The BLUE wire should be connected to the vehicle's ignition or, if required, a dedicated ON/OFF switch. When connected in this way, the power supply will only run the connected loads when the vehicle ignition is ON, guaranteeing that the power supply will not drain the start battery.

2.3 ORANGE wire - Output Voltage Select

The ORANGE wire is used to select the output voltage. This is achieved by connecting in the following way:

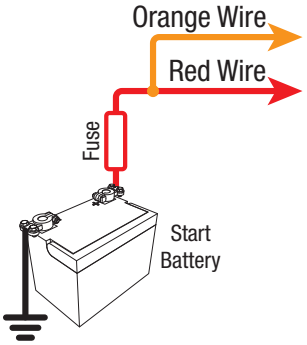
For 12.0V output on the DPS1225/DPS1240
or
24.0V output on the DPS2410/DPS2420
Leave the ORANGE wire disconnected.

OR

For 13.7V output on the DPS1225/DPS1240
or
27.4V output on the DPS2410/DPS2420,
Connect the ORANGE wire to Common Ground.

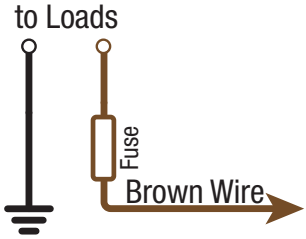
OR

For 14.5V output on the DPS1225/DPS1240
or
29.0V output on the DPS2410/DPS2420
Connect the ORANGE wire to the RED wire (Input source positive)



2.4 BROWN wire - Output load Positive

The BROWN wire should be connected to the output load's positive terminal. This should be a maximum of 1 metre in cable length from the DPS. Appropriate size fuses should be used as per the specifications table on page 2.

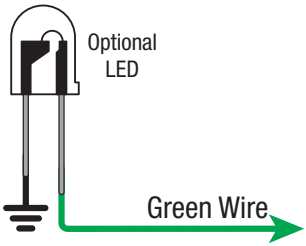


2.5 BLACK wire - Common Ground

The BLACK wire should be connected to a ground point that is common to both the Start battery and the Load. This point may be on the chassis of the vehicle or on the chassis of the trailer depending on your installation requirements.

2.6 GREEN wire - Optional External LED Indication

The GREEN wire is provided to optionally connect an external indicator LED which can be mounted away from the unit (for example on the vehicle's dashboard). Connect the positive lead of the LED to the green wire, and the negative lead to the common ground. No external resistors are required. "12V" LEDs and filament globes are not suitable.
This LED will illuminate constantly when the DPS is supplying power, it will flash a fault code if the DPS has detected an error.



2.7 Earth Isolation

If the DPS is installed on a vehicle fitted with an earth isolation switch, the BLACK wire must run to chassis earth/ground and NOT the supply battery's negative post. This ensures that the DPS is also disconnected when the isolation switch is activated.

2.8 Cable sizing

Below is a table outlining the required cable size for a given cable install length. Always choose a wire diameter equal to or greater than what is specified below.

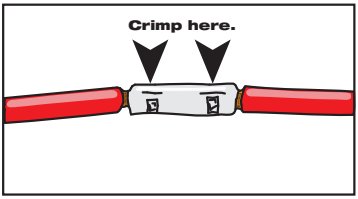
Part Number	Cable Install Length (m)	Recommended Wire Size (mm^2)	Closest (BAE, B&S, AWG)
DPS1225/ DPS2410	1 - 5	7.71	8
	5 - 9	13.56	6
DPS1240/ DPS2420	1 - 5	13.56	6
	5 - 9	20.28	4

2.9 Wiring

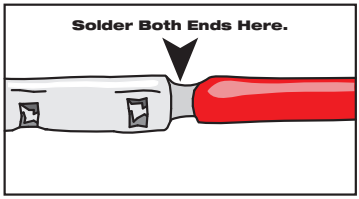
The heavy gauge wires on the DPS1225, DPS1240, DPS2410 and DPS2420 unit carry peak currents of up to 40Amps and it is important to make a good, low resistance, electrical connection that will not degrade over time. Failure to make a good, reliable contact may result in breakdown of the wire insulation and cause a short circuit, or worst case a fire. We recommend that this activity be undertaken by an appropriately trained person.

REDARC recommends using a soldered butt splice crimp connection that is covered with heatshrink. See Figure 2.9.1. REDARC does not recommend using standard red/ blue/yellow blade connections as they are not rated for either the current required or gauge of wire supplied on the unit.

Crimping provides good mechanical connection, soldering provides a long lasting electrical connection and forming of the heatshrink will reduce the risk of shorting/contact with your vehicle chassis.



Crimp both wires to the butt splice using indent type crimpers.



Solder the wires to the butt splice. Ensure that a good connection is made. Keep heatshrink away until after soldering is complete and has cooled.

Figure 2.9.1 - Ensuring a good wiring connection

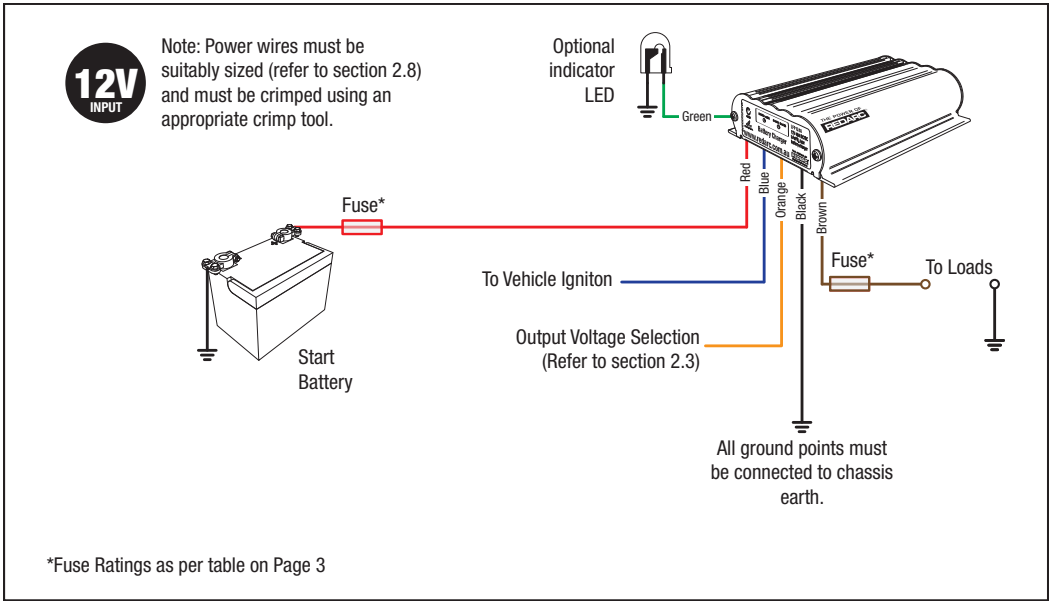


Figure 2.9.2 - Standard 12V Input setup

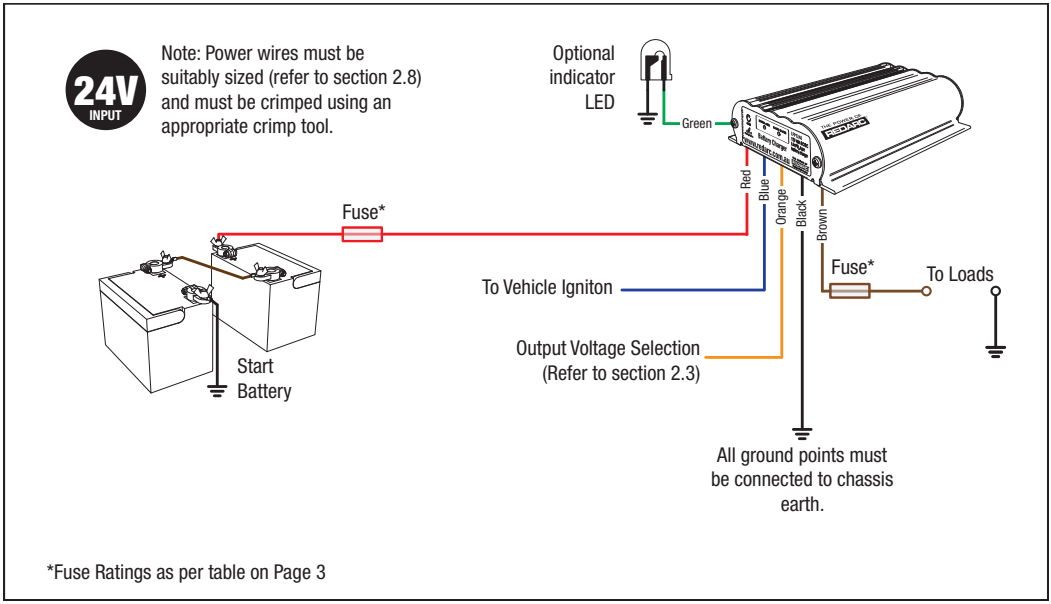


Figure 2.9.3 - Standard 24V Input setup

2.10 Connecting in Parallel

It is possible to connect two DPS units in parallel to increase the current output. For example; two DPS1240s connected in parallel would produce a maximum of 80Amps for a load. Parallel connection requires specific installation;

- Both DPS units must be mounted to the chassis of the vehicle for external heat sinking.
- The DPS units must be mounted close to each other.
- The RED, BROWN, BLACK, BLUE & ORANGE wires from both units must be joined to their matching colour with the same size and length cables.
- The input, output and earth wiring must be suitably sized to carry the constant high current. Refer to REDARC's cable size guide for more information: *http://www.redarc.com.au/handy-hints/how_to/calculate_wire_gauge/*
- Suitably rated fuses must be used; Refer to page 3.

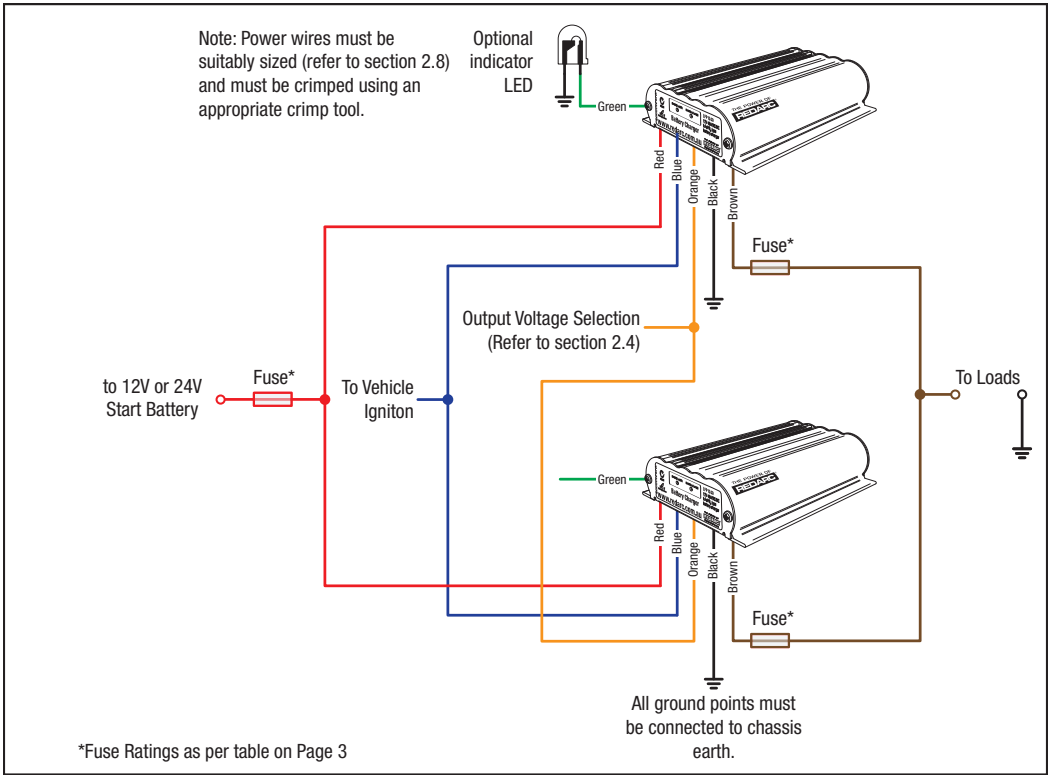


Figure 2.10.1 - Parallel Connection of two DPS units for increased output rating

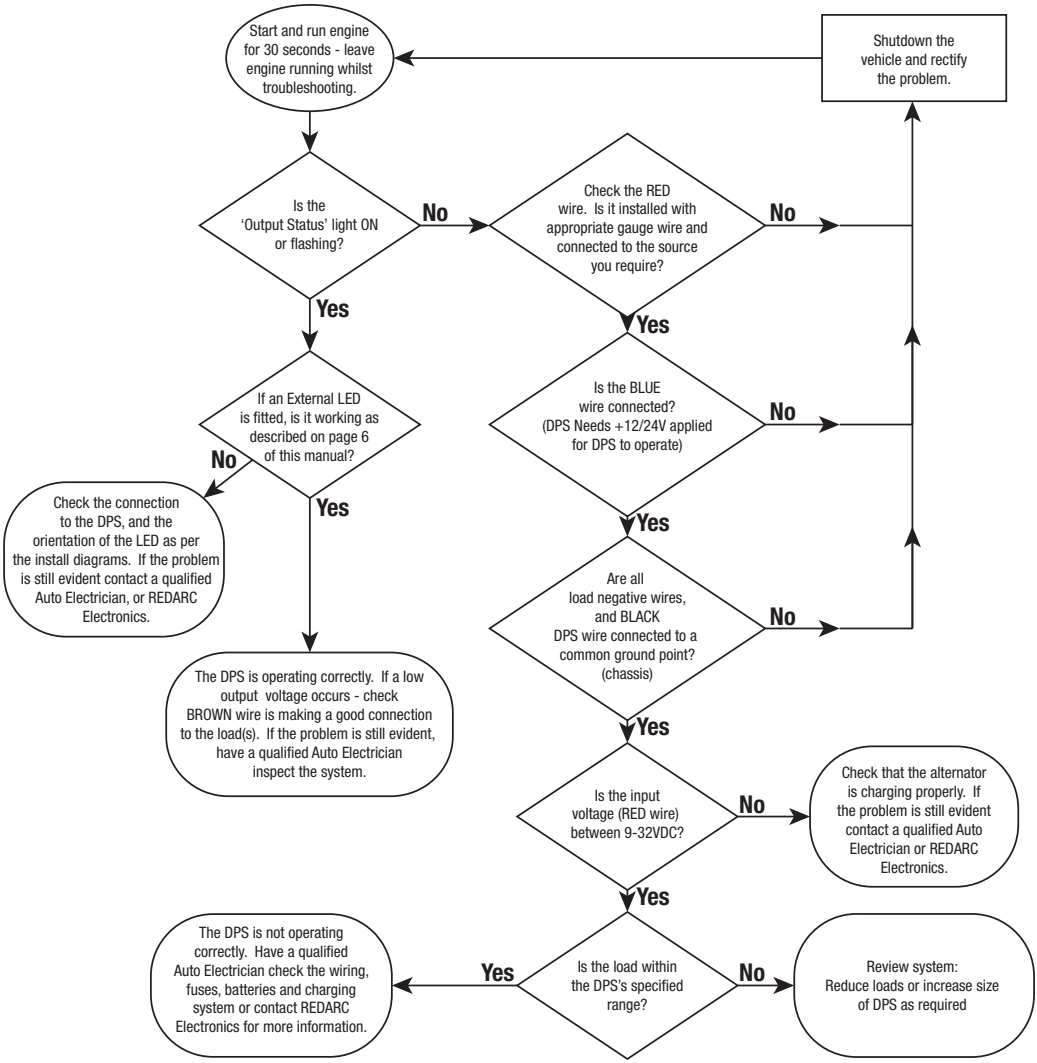

Start and run engine for 30 seconds - leave engine running whilst troubleshooting.
Shutdown the vehicle and rectify the problem.
Is the 'Output Status' light ON or flashing?
No
Check the RED wire. Is it installed with appropriate gauge wire and connected to the source you require?
No
Yes
Yes
If an External LED is fitted, is it working as described on page 6 of this manual?
Is the BLUE wire connected? (DPS Needs +12/24V applied for DPS to operate)
No
No
Yes
Yes
Check the connection to the DPS, and the orientation of the LED as per the install diagrams. If the problem is still evident contact a qualified Auto Electrician, or REDARC Electronics.
Are all load negative wires, and BLACK DPS wire connected to a common ground point? (chassis)
No
Yes
The DPS is operating correctly. If a low output voltage occurs - check BROWN wire is making a good connection to the load(s). If the problem is still evident, have a qualified Auto Electrician inspect the system.
Is the input voltage (RED wire) between 9-32VDC?
No
Check that the alternator is charging properly. If the problem is still evident contact a qualified Auto Electrician or REDARC Electronics.
Yes
The DPS is not operating correctly. Have a qualified Auto Electrician check the wiring, fuses, batteries and charging system or contact REDARC Electronics for more information.
Yes
Is the load within the DPS's specified range?
No
Review system: Reduce loads or increase size of DPS as required

Figure 3.1 - DPS Troubleshooting Guide

5 TWO YEAR PRODUCT WARRANTY

Over the last three decades our company has established a reputation as the power conversion specialist.

A 100% Australian-owned company, we have met the needs of customers in transport and other industries through exciting, innovative thinking.

We believe in total customer satisfaction and practice this by offering our customers:

- **Technical advice free of jargon and free of charge**
- **Prompt turnaround of orders throughout Australia and globally**
- **Friendly, personalised, professional service and product support**

In the unlikely event that a technical issue arises with a Redarc product, customers are encouraged to initially contact the Redarc Technical Support Team on (08) 8322 4848 or power@redarc.com.au for prompt and efficient diagnosis and product support.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The benefits of this Warranty are in addition to other rights and remedies available at law in respect of the Products and shall not derogate from any applicable mandatory statutory provisions or rights under the Australian Consumer Law.

Redarc Electronics Pty Ltd atf the Redarc Trust trading as Redarc Electronics ("Redarc") offers a warranty in respect of its Products where the Products are purchased from an authorised distributor or reseller of Redarc by a person ("Purchaser"), on the terms and conditions, and for the duration, outlined below in this document ("Warranty").

1. In this Warranty, the term **Products** means:
   1.1 all products manufactured or supplied by Redarc (excluding its solar products which are covered by Redarc's Solar Product Warranty); and
   1.2 any component of or accessory for any product in clause 1.1 manufactured or supplied by Redarc.

Offer and duration of product warranties

2. Redarc warrants that its Products will be free, under normal application, installation, use and service conditions, from defects in materials and workmanship affecting normal use, for **2 years** from the date of purchase (**Warranty Period**).
3. Where a Product malfunctions or becomes inoperative during the Warranty Period, due to a defect in materials or workmanship, as determined by Redarc, then subject to further rights conferred by the Australian Consumer Law on the Purchaser, Redarc will, in exercise of its sole discretion, either:
   3.1 repair the defective Product;
   3.2 replace the defective Product; or
   3.3 provide a refund to the Purchaser for the purchase price paid for the defective Product,

   without charge to the Purchaser.
4. The warranty given by Redarc in clause 3 covers the reasonable costs of delivery and installation of any repaired or replaced Products or components of Products to the Purchaser's usual residential address notified to Redarc, together with the reasonable costs of removal and return of any Products determined by Redarc to be defective.
5. If the Purchaser incurs expenses of the nature referred to in clause 4 in the context of making a claim pursuant to this Warranty that is accepted by Redarc, the Purchaser will be entitled to claim for reimbursement of those expenses which Redarc determines, in exercise of its sole discretion, to be reasonably incurred, provided that the claim is notified to Redarc in writing at the postal address or email address specified in clause 21 and includes:
   5.1 details of the relevant expenses incurred by the Purchaser; and
   5.2 proof of the relevant expenses having been incurred by the Purchaser.

Exclusions and limitations

6. This Warranty will not apply to, or include any defect, damage, fault, failure or malfunction of a Product, which Redarc determines, in exercise of its sole discretion, to be due to:
   6.1 normal wear and tear or exposure to weather conditions over time;
   6.2 accident, misuse, abuse, negligence, vandalism, alteration or modification;
   6.3 non-observance of any of the instructions supplied by Redarc, including instructions concerning installation, configuring, connecting, commissioning, use or application of the Product, including without limitation choice of location;
   6.4 failure to ensure proper maintenance of the Product strictly in accordance with Redarc's instructions or failure to ensure proper maintenance of any associated equipment or machinery;
   6.5 repairs to the Product that are not strictly in accordance with Redarc's instructions;
   6.6 installation, repairs or maintenance of the Product by, or under the supervision of, a person who is not a qualified auto electrician or technician, or if non-genuine or non-approved parts have been fitted;
   6.7 faulty power supply, power failure, electrical spikes or surges, lightning, flood, storm, hail, extreme heat, fire or other occurrence outside the control of Redarc;
   6.8 use other than for any reasonable purpose for which the Product was manufactured;
   6.9 any indirect or incidental damage of whatever nature outside the control of Redarc.
7. Warranty claims in respect of a Product must be made in writing to Redarc at the postal address or email address specified in clause 21 within the Warranty Period. Such claims must include the following:
   7.1 details of the alleged defect or fault and the circumstances surrounding the defect or fault;
   7.2 evidence of the claim, including photographs of the Product (where the subject of the claim is capable of being photographed);
   7.3 the serial number of the Product, specified on the label affixed to the Product; and
   7.4 proof of purchase documentation for the Product from an authorised distributor or reseller of Redarc, which clearly shows the date and place of purchase.

   The return of any Products without the prior written instructions of Redarc will not be accepted by Redarc.
8. Without limiting any other clause in this Warranty, Redarc has the right to reject any Warranty claim made by a Purchaser pursuant to this Warranty where:
   8.1 the Purchaser does not notify Redarc in writing of a Warranty claim within the Warranty Period;
   8.2 the Purchaser does not notify Redarc in writing of a Warranty claim within 1 month of becoming aware of the relevant circumstances giving rise to the claim, so that any further problems with the Product are minimised;
   8.3 the serial number of the Product has been altered, removed or made illegible without the written authority of Redarc;
   8.4 the Purchaser is unable to provide proof of purchase documentation in accordance with clause 7.4 or evidence that the Product was properly installed and removed (if relevant), and that proper maintenance has been performed on the Product, by, or under the supervision of, a qualified auto electrician or technician, in accordance with the instructions of Redarc.
9. If the Product is found to be working satisfactorily on return to Redarc or upon investigation by Redarc, the Purchaser must pay Redarc's reasonable costs of testing and investigating the Product in addition to shipping and transportation charges. Where Redarc is in possession of the Product, the Product will be returned to the Purchaser on receipt of the amount charged.
10. Any replaced Products or components of Products shall become the property of Redarc.
11. Redarc may, in exercise of its sole discretion, deliver another type of Product or component of a Product (different in size, colour, shape, weight, brand and/or other specifications) in fulfilling its obligations under this Warranty, in the event that Redarc has discontinued manufacturing or supplying the relevant Product or component at the time of the Warranty claim, or where such Product or component is superior to that originally purchased by the Purchaser.

Other conditions of Warranty

12. If the Purchaser acquired a Product for the purpose of resupply, then this Warranty shall not apply to that Product.
13. In particular, the sale of a Product via an online auction, online store or other internet website by a party that is not an authorised distributor or reseller of the Product will be deemed to be a resupply within the meaning of the Australian Consumer Law and will render this Warranty void, as Redarc has no control over the storage, handling, quality or safety of Products sold by such persons.
14. A Purchaser shall only be entitled to the benefit of this Warranty after all amounts owing in respect of the Product have been paid.
15. While Redarc warrants that the Products will be free from defects in materials and workmanship in the circumstances set out in this Warranty, to the maximum extent permitted by law Redarc does not warrant that the operation of the Products will be uninterrupted or error-free.
16. To the maximum extent permitted by law, Redarc's determination of the existence of any defect and the cause of any defect will be conclusive.
17. Spare parts or materials for the Products are guaranteed to be available for a period of at least 2 years after purchase of the Products.
18. The agents, officers and employees of any distributor or reseller of the Products and of Redarc are not authorised to vary or extend the terms of this Warranty.
19. Redarc shall not be responsible or liable to the Customer or any third party in connection with any non-performance or delay in performance of any terms and conditions of this Warranty, due to acts of God, war, riots, strikes, warlike conditions, plague or other epidemic, fire, flood, blizzard, hurricane, changes of public policies, terrorism and other events which are beyond the control of Redarc. In such circumstances, Redarc may suspend performance of this Warranty without liability for the period of the delay reasonably attributable to such causes.
20. If a clause or part of a clause in this Warranty can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way. If any clause or part of a clause in this Warranty is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Warranty, but the rest of this Warranty is not affected.

Redarc's contact details

21. Redarc's contact details for the sending of Warranty claims under this Warranty are:

Redarc Electronics Pty Ltd
23 Brodie Road (North), Lonsdale SA 5160
Email: power@redarc.com.au
Telephone: +61 8 8322 4848

THE POWER OF

REDARC®

Free technical assistance!

please contact

REDARC Electronics

23 Brodie Road North, Lonsdale SA

(08) 8322 4848

power@redarc.com.au

www.redarc.com.au

Copyright © 2015 REDARC Electronics Pty Ltd. All rights reserved.

WARDPS-REV1

www.redarc.com.au